WHAT IS CLAIMED IS:

1. A dispersion managed optical fiber,

for wavelength division multiplex transmission networks,

the fiber including positive chromatic dispersion optical fiber portions (T+) alternating longitudinally with negative chromatic dispersion optical fiber portions (T-),

the fiber comprising in succession from the center towards the periphery a core having a varying index profile and then a cladding having a constant index,

the outside radius of the index profile of the core, which is the limit between the core and the cladding, being sufficiently small for the optical fiber to function in monomode in-cable,

each optical fiber portion (T+, T-) having at a wavelength of 1550 nm a chromatic dispersion whose absolute value is from 1 ps/nm.km to 10 ps/nm.km, a chromatic dispersion slope whose absolute value is less than 0.015 ps/nm.km, and an effective area greater than 35 μm^2,

the relative effective area difference at a wavelength of 1550 nm between the positive chromatic dispersion optical fiber portions (T+) and the negative chromatic dispersion optical fiber portions (T-) being less than 7%, and

each optical fiber portion (T+, T-) having bending losses at a wavelength of 1625 nm less than 0.1 dB for 100 turns with a diameter of 60 mm.

2. A dispersion managed optical fiber according to claim 1, characterized in that the average of the outside radius (r_3) of the index profile of the core, which is the limit between the core and the cladding, is less than 10.5 μm^2 in all the optical fiber portions (T+, T-), and in that the index profile of the core comprises three slices.

3. A dispersion managed optical fiber according to claim 2, characterized in that the varying index profile of the core comprises successively, from the center towards the periphery,

a central slice having a maximum index higher than the index of the cladding,

a buried slice having a minimum index lower than the index of the cladding, and

an annular slice having a maximum index higher than the index of the cladding and lower than the maximum index of the central slice.

4. A dispersion managed optical fiber according to claim 3, characterized in that the central slice is trapezium-shaped or alpha-shaped.

5. A dispersion managed optical fiber according to claim 3,

characterized in that the average of the difference ($\Delta n1$) between the maximum index of the central slice and the index of the cladding is from 7.00×10^{-3} to 11.0×10^{-3} in all the optical fiber portions (T+, T-),

and in that the average of the radius (r_1) of the portion of the central slice having an index higher than the index of the cladding is from 2.65 μm to 3.70 μm in all the optical fiber portions (T+, T-).

6. A dispersion managed optical fiber according to claim 5, characterized in that, for an average portion of optical fiber whose index profile radius values correspond to the averages of the radius values of the index profiles of all the optical fiber portions (T+, T-), the value of the integral ($S_{01} = \int_0^{r1} \Delta n(r).dr$) of the index difference relative to the index of the cladding between a zero radius and the radius (r_1) of the portion

of the central slice having an index higher than the index of the cladding is greater than 23.0×10^{-3} μm.

7. A dispersion managed optical fiber according to claim 6, characterized in that, for an average portion of optical fiber whose index profile radius values correspond to the averages of the radius values of the index profiles of all the optical fiber portions (T+, T-), twice the value $(S_1 = 2.\int_0^{r1}\Delta n(r).r.dr)$ of the integral of the product of the radius and the index difference relative to the index of the cladding between a zero radius and the radius (r_1) of the portion of the central slice having an index higher than the index of the cladding is from 58×10^{-3} μm^2 to 99×10^{-3} μm^2.

8. A dispersion managed optical fiber according to claim 7, characterized in that, for an average portion of optical fiber whose index profile radius values correspond to the averages of the radius values of the index profiles of all the optical fiber portions (T+, T-), three times the value $(S_{II} = 3.\int_0^{r1}\Delta n(r).r^2.dr)$ of the integral of the product of the square of the radius and the index difference relative to the index of the cladding between a zero radius and the radius (r_1) of the portion of the central slice having an index higher than the index of the cladding is from 150×10^{-3} μm^3 to 335×10^{-3} μm^3.

9. A dispersion managed optical fiber according to claim 5,

characterized in that the average of the difference ($\Delta n2$) between the minimum index of the buried slice and the index of the cladding is from -9×10^{-3} and -2.5×10^{3} over all the optical fiber portions (T+, T-)

and in that the average of the outside radius (r_2)

of the buried slice is from 4.00 μm to 8.10 μm in all the optical fiber portions (T+, T-).

10. A dispersion managed optical fiber according to claim 9, characterized in that, for an average portion of optical fiber whose index profile radius values correspond to the averages of the radius values of the index profiles of all the optical fiber portions (T+, T-), the value of the integral $(S_{02} = \int_{r1}^{r2} \Delta n(r).dr)$ of the index difference relative to the index of the cladding between the radius (r_1) of the portion of the central slice having an index higher than the index of the cladding and the outside radius (r_2) of the buried slice is from 22.0×10^{-3} μm to -8.0×10^{-3} μm.

11. A dispersion managed optical fiber according to claim 9,

characterized in that the average of the difference (Δn_3) between the maximum index of the annular slice and the index of the cladding is from 0.50×10^{-3} to 7.5×10^{-3} over all the optical fiber portions (T+, T-),

and in that the average of the outside radius (r_3) of the annular slice is from 6.70 μm to 10.50 μm in all the optical fiber portions (T+, T-).

12. A dispersion managed optical fiber according to claim 11, characterized in that, for an average portion of optical fiber whose index profile radius values correspond to the averages of the radius values of the index profiles of all the optical fiber portions (T+, T-), the value of the integral $(S_{03} = \int_{r2}^{r3} \Delta n(r).dr)$ of the index difference relative to the index of the cladding between the external radius (r_2) of the buried slice and the external radius (r_3) of the annular slice is from 1.0×10^{-3} μm to 15×10^{-3} μm.

13. A dispersion managed optical fiber according to claim 1, characterized in that the average of the outside radius (r_4) of the index profile of the core, which is the limit between the core and the cladding, is less than 16 μm in all the optical fiber portions (T+, T-) and in that the index profile of the core comprises four slices.

14. A dispersion managed optical fiber according to claim 13, characterized in that the varying index profile of the core comprises successively, from the center towards the periphery,

a central slice having a maximum index higher than the index of the cladding,

a first buried slice having a minimum index lower than the index of the cladding,

an annular slice having a maximum index higher than the index of the cladding and lower than the maximum index of the central slice, and

a second buried slice having a minimum index lower than the index of the cladding.

15. A dispersion managed optical fiber according to claim 14,

characterized in that the average (T+, T-) of the difference (Δn_1) between the maximum index of the center slice and the index of the cladding is from 7.0×10^{-3} to 10.0×10^{-3} in all the optical fiber portions,

and in that the average of the radius (r_1) of the portion of the central slice having an index higher than the index of the cladding is from 2.5 μm to 3.5 μm in all the optical fiber portions (T+, T-).

16. A dispersion managed optical fiber according to claim 15,

characterized in that the average of the difference (Δn_2) between the maximum index of the first buried slice

and the index of the cladding is from -9.0×10^{-3} to -2.5×10^{-3} in all the optical fiber portions (T+, T-),

and in that the average of the outside radius (r_2) of the buried slice is from 4.1 μm to 7.0 μm in all the optical fiber portions (T+, T-).

17. A dispersion managed optical fiber according to claim 16,

characterized in that the average of the difference (Δn_3) between the maximum index of the annular slice and the index of the cladding is from 0.5×10^{-3} to 5.0×10^{-3} in all the optical fiber portions (T+, T-),

and in that the average of the outside radius (r_3) of the annular slice is from 9.0 μm to 13.0 μm in all the optical fiber portions (T+, T-).

18. A dispersion managed optical fiber according to claim 17,

characterized in that the average of the difference (Δn_4) between the minimum index of the second buried slice and the index of the cladding is from -9.0×10^{-3} to -2.0×10^{-3} in all the optical fiber portions (T+, T-),

and in that the average of the outside radius (r_4) of the second buried slice is from 12.0 μm to 16.0 μm in all the optical fiber portions (T+, T-).

19. A dispersion managed optical fiber according to claim 1, characterized in that said dispersion managed optical fiber is obtained by modifying the properties of a single preform.

20. A dispersion managed optical fiber according to claim 1, characterized in that the relative outside radius difference between the positive chromatic dispersion optical fiber portions and the positive negative chromatic dispersion optical fiber portions is made less than 11%.

21. A dispersion managed optical fiber according to claim 1, characterized in that the optical fiber has an attenuation less than or equal to 0.35 dB/km at a wavelength of 1550 nm.

22. A dispersion managed optical fiber according to claim 1, characterized in that the optical fiber has a polarization mode dispersion less than or equal to 0.2 $ps/km^{1/2}$, preferably less than or equal to 0.1 $ps/km^{1/2}$, and even more preferably less than or equal to 0.05 $ps/km^{1/2}$ at a wavelength of 1550 nm.

23. A dispersion managed optical fiber according to claim 1, characterized in that the optical fiber has bending losses less than 400 dB/m at a wavelength of 1625 nm as measured for a radius of 10 mm in any of the portions constituting said optical fiber.